

Name: _____

Small Engine Technician

Directions:

Evaluate the student by checking the appropriate number to indicate the degree of competency.

Rating Scale (0-6):

- 0 No Exposure** – no experience/knowledge in this area; program/course did not provide instruction in this area
- 1 Unsuccessful Attempt** – unable to meet knowledge or performance criteria and/or required significant assistance
- 2 Partial Demonstration** – met some of the knowledge or performance criteria with or without minor assistance
- 3 Knowledge Demonstrated** – met knowledge criteria without assistance at least once
- 4 Performance Demonstrated** – met performance criteria without assistance at least once
- 5 Repetitive Demonstration** – met performance and/or knowledge criteria without assistance on multiple occasions
- 6 Mastered** – successfully applied knowledge or skills in this area to solve related problems independently

NOTE:

* = Core competencies (essential for the first day on the job).

0	1	2	3	4	5	6	A. Appreciate and apply all personal safety procedures	Notes:
							*1. Demonstrate safe work habits by using approved eye, ear, and skin protection	
							*2. Demonstrate safe handling of hazardous materials	
							3. Read and interpret MSDS and other safety publications	
							4. Identify governmental regulations (EPA, DNR, ANSI)	
							*5. Recognize industry accepted procedures for using proper safety devices, including lock out/tag and blocking devices	
							*6. Use basic personal safety practices (no jewelry, no loose clothing, long hair tied back)	
							*7. Demonstrate proper lifting practices	
							Other:	

0	1	2	3	4	5	6	B. Appreciate and apply all laboratory and tool safety procedures	Notes:
							*1. Demonstrate the safe use of lifting and hoisting devices	
							*2. Maintain a clean and safe work area	
							*3. Demonstrate the safe and proper use of hand tools	
							*4. Demonstrate the safe and proper use of power tools	
							*5. Identify the proper use of fire extinguishers	
							*6. Recognize standard emergency evacuation procedures	
							*7. Identify fire hazards	
							*8. Identify spill containment	
							*9. Demonstrate safe use of cleaning equipment and chemicals	
							Other:	

0	1	2	3	4	5	6	C. Demonstrate counter and business skills	Notes:
							*1. Demonstrate good customer relations skills	
							*2. Document service work and supplies on work orders	
							*3. Read and interpret service and parts manuals	
							*4. Use basic computer skills	
							5. Demonstrate proper use of labor time guides, flat rate time, and billing efficiency	
							*6. Explain warranty claim process	
							7. Estimate repair vs. replacement costs (labor, parts)	
							Other:	

0	1	2	3	4	5	6	D. Use tools and equipment consistent with industry and safety standards	Notes:
							*1. Identify industry-related hand tools	
							*2. Demonstrate the proper use of hand tools	
							*3. Identify precision measuring tools and equipment	
							*4. Demonstrate the proper use and care of precision measuring tools and equipment	
							*5. Identify industry-related power tools	
							*6. Demonstrate the proper use and care of industry-related power tools	
							*7. Identify and use tools to restore threads on fasteners	
							*8. Identify diagnostic tools	
							*9. Demonstrate the proper use and care of diagnostic tools	
							Other:	

0	1	2	3	4	5	6	E. Apply fasteners consistent with industry and safety standards	Notes:
							1. Identify and select industry-related fasteners	
							2. Measure bolts and threads (SAE grade and metric)	
							*3. Determine proper torque value for fasteners	
							*4. Demonstrate proper torquing technique for fasteners	
							5. Identify and select proper gaskets and sealants	
							Other:	

0	1	2	3	4	5	6	F. Identify engines and products	Notes:
							*1. Identify the manufacturer, model, serial number, and type	

								*2. Identify emission compliance engines	
								*3. Identify safety compliance parts	
								Other:	

0	1	2	3	4	5	6	G. Service a four-stroke cycle engine consistent with industry and safety standards	Notes:
							*1. Describe the operating cycle of the four-stroke cycle engine	
							*2. Disassemble a four-stroke cycle engine	
							3. Inspect and service a cylinder	
							4. Inspect and service the pistons, rings, and connecting rod	
							5. Inspect and service a crankshaft assembly	
							*6. Inspect and service a valve train assembly	
							*7. Reassemble a four-stroke cycle engine	
							*8. Identify the differences between L-head and overhead valve trains	
							*9. Test compression	
							Other:	

0	1	2	3	4	5	6	H. Service a two-stroke cycle engine consistent with industry and safety standards	Notes:
							*1. Describe the operating cycle of the two-stroke cycle engine	
							*2. Disassemble a two-stroke cycle engine	
							*3. Inspect and service a cylinder	
							4. Inspect and service the pistons, rings, and connecting rod	
							5. Inspect and service a crankshaft assembly	
							6. Check and replace reed valves	
							*7. Reassemble two-stroke cycle engines	
							*8. Test compression	
							Other:	

0	1	2	3	4	5	6	I. Demonstrate compliance with emissions standards	Notes:
							1. List types of emissions	
							*2. Describe the consequences of noncompliance with emissions standards	
							3. Comply with manufacturer's emissions standards	

								Other:	
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0	1	2	3	4	5	6	J. Troubleshoot small engine systems	Notes:
							*1. Identify the system and components	
							*2. Recognize the sequence of events in a system	
							*3. Access technical manuals to find information and specifications	
							4. Interview the customer and/or operator for information	
							5. Identify exact symptoms	
							6. Accurately separate systems	
							*7. Make a complete physical examination	
							*8. Replicate or simulate a given problem	
							*9. Determine and classify all symptoms	
							*10. Perform specific tests using tools to determine which components work correctly	
							*11. Record the results on a worksheet	
							*12. Make repairs and retest to verify the repair	
							*13. Communicate with the customer regarding the cause and prevention of future problems	
							Other:	

0	1	2	3	4	5	6	K. Service fuel systems consistent with industry and safety standards	Notes:
							*1. Test, repair, or replace fuel pump	
							*2. Test, repair, or replace fuel filters and strainers	
							*3. Remove, clean, and replace fuel tank, shut-off valves, fuel lines, fuel hoses, and connections	
							*4. Clean, rebuild, or replace diaphragm-type carburetor	
							*5. Clean, rebuild, or replace float-type carburetor	
							*6. Adjust fuel mixture and check for air leaks	
							*7. Service oil-foam air cleaner	
							*8. Service dry-element air cleaner	
							*9. Properly dispose of contaminated fuel	
							*10. Explain the theory and function of electronic fuel injection	
							11. Identify the types and grades of gasoline used in power equipment	
							*12. Describe the use of a fuel additive for storage	

								*13. Identify purge/prime systems	
								*14. Identify fuel venting systems	
								*15. Troubleshoot a fuel system	
								Other:	

0	1	2	3	4	5	6	L. Service governor systems consistent with industry and safety standards	Notes:
							*1. Identify the purpose of the governor system	
							*2. Inspect, adjust, and repair air-vane governor system	
							*3. Inspect, adjust, and repair mechanical governor system and linkages	
							*4. Adjust engine RPMs to manufacturer's specifications	
							*5. Troubleshoot a governor system	
							Other:	

0	1	2	3	4	5	6	M. Service electrical systems consistent with industry and safety standards	Notes:
							*1. Demonstrate safe work habits when working with electrical systems	
							*2. Explain basic electrical theory	
							3. Describe series circuit	
							4. Describe parallel circuit	
							*5. Explain different types of circuit failures	
							*6. Demonstrate applicable test procedures for testing series and parallel circuits	
							*7. Check continuity in circuits and electrical system components	
							*8. Check current flow in electric systems and components	
							*9. Inspect, test, and replace fusible links, fuses, and circuit breakers	
							10. Identify terminal and connectors used in electrical systems	
							11. Identify electrical wire sizes and selection based on anticipated current load	
							12. Read and interpret electrical meters	
							13. Read electrical schematics	
							*14. Test, repair, and/or replace safety interlock	
							*15. Test, repair, and/or replace charging system components	
							*16. Test and replace fuel system, lubrication, safety, and temperature sending units	
							*17. Test and replace electrical PTO clutches	

								*18.Explain storage battery theory and operation	
								*19.Remove, clean, and replace battery	
								*20.Perform specific gravity test on battery cell electrolyte	
								*21.Determine battery state of charge using DMM (Digital Multimeter)	
								*22.Troubleshoot an electrical system	
								Other:	

0	1	2	3	4	5	6	N. Service ignition systems consistent with industry and safety standards	Notes:
							*1. Explain the theory of operation of the ignition system	
							*2. Identify the components and function of an ignition system	
							*3. Remove and service spark plug	
							*4. Test and repair breaker ignition system	
							*5. Test and repair electronic ignition system	
							*6. Identify the components and function of a battery ignition system	
							*7. Identify the function and components of an electronic ignition system	
							*8. Identify the components and function of a magneto ignition system	
							*9. Troubleshoot an ignition system	
							Other:	

0	1	2	3	4	5	6	O. Service lubrication systems consistent with industry and safety standards	Notes:
							*1. Explain the importance of lubrication	
							*2. List common oil contaminants	
							*3. Change engine oil and oil filter	
							*4. Properly dispose of oil and oil filter	
							*5. Service crankcase breather	
							*6. Inspect, repair, and/or replace pressure lubrication system	
							*7. Inspect and replace splash lubrication components	
							*8. Locate and repair leaking gaskets and seals	
							*9. Demonstrate the ability to mix gas and oil for a two-stroke cycle engine	
							*10.Select proper oil	
							*11.Troubleshoot a lubrication system	

								Other:	
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0	1	2	3	4	5	6	P. Service cooling systems consistent with industry and safety standards	Notes:
							*1. Describe the concepts of heat transfer	
							*2. Explain the purpose of a cooling system	
							*3. Identify the major types of cooling systems used on power equipment	
							*4. Describe air-cooled system nomenclature and function	
							*5. List the major causes of air-cooled engine overheating	
							*6. Describe normal cooling-related service procedures performed on an air-cooled engine	
							*7. Describe liquid-cooled nomenclature and function	
							*8. List major causes of liquid-cooled engine overheating	
							*9. Describe the function of a thermostat	
							*10. Describe the function of a water pump	
							*11. Describe the function of antifreeze	
							*12. Remove and replace water pump/fan belt drive	
							*13. Perform a cooling system pressure test	
							*14. Service an air-cooled system	
							*15. Service a liquid-cooled system	
							*16. Remove, check, and replace thermostat	
							*17. Remove, check, and replace radiator	
							*18. Troubleshoot a cooling system	
							Other:	

0	1	2	3	4	5	6	Q. Service exhaust systems consistent with industry and safety standards	Notes:
							1. Describe exhaust system nomenclature and function	
							2. Describe proper service cleaning procedures for exhaust ports and spark arrestor screens	
							*3. Service and/or replace a two-stroke cycle exhaust system	
							*4. Service and/or replace a four-stroke cycle exhaust system	
							*5. Troubleshoot an exhaust system	
							Other:	

0	1	2	3	4	5	6	R. Service recoil starting systems consistent with industry and safety standards	Notes:
							*1. Remove, repair, and/or replace recoil starter	
							*2. Remove, inspect, and replace starter clutch	
							*3. Demonstrate safe spring replacement procedures	
							*4. Troubleshoot a recoil starting system	
							Other:	

0	1	2	3	4	5	6	S. Service electrical starting systems consistent with industry and safety standards	Notes:
							*1. Describe engine starting systems, nomenclature, and function	
							*2. Identify the components of a DC electrical starting system and describe the function of each	
							*3. Identify the components of an AC electrical starting system and describe the function of each	
							4. Perform 12-volt DC starter motor current draw test	
							*5. Remove and replace starter motor	
							*6. Remove, test, and replace starter relay	
							*7. Troubleshoot an electrical starting system	
							Other:	

0	1	2	3	4	5	6	T. Service charging systems consistent with industry and safety standards	Notes:
							*1. Define electrical/electronic terms that are common in the power equipment industry	
							*2. Describe charging system nomenclature and function	
							*3. Identify types of charging systems	
							*4. Describe a DC amps test	
							*5. Describe an AC volts test	
							*6. Explain the function of a diode	
							*7. Describe a resistance test	
							8. Perform current drain test using DC shunt	
							*9. Remove and replace regulator/rectifier	
							*10. Troubleshoot a charging system	
							Other:	

0	1	2	3	4	5	6	U. Service power train systems consistent with industry and safety standards	Notes:
							1. Identify the component parts of a manual transmission	
							2. Identify the component parts of a transaxle	
							3. Identify the component parts of a clutch system	
							4. Identify the component parts of a hydrostatic transmission	
							*5. Identify the component parts of brake systems	
							*6. Isolate and troubleshoot a power train system	
							Other:	

0	1	2	3	4	5	6	V. Service lawn and garden equipment consistent with industry and safety standards	Notes:
							*1. Adjust tension and alignment of pulleys and belts	
							*2. Sharpen and balance rotary blades	
							*3. Adjust and replace control cables/linkages	
							*4. Service decks and accessories	
							*5. Lubricate chassis components	
							*6. Inspect and adjust brakes	
							*7. Inspect and adjust clutch	
							Other:	

0	1	2	3	4	5	6	W. Analyze system failures	Notes:
							1. Identify the effects of abrasive ingestion on engine components	
							2. Identify the entrance path of abrasives on several engine failure examples	
							3. Identify the effects of insufficient lubrication on engine components	
							4. Define cause of failure on several engine failure examples	
							5. Identify two-stroke lubrication/fuel quality failure root cause	
							6. Identify the effects of incorrect/no lubricant	
							7. Identify and describe engine failures caused by phase separation of fuel	
							8. Identify the effect of overheating on engine component parts	
							9. Identify overheating effects on two-stroke cycle engines due to poor exhaust system maintenance	
							10. Define denotation, preignition, and list the effects on engine components	
							11. Identify two-stroke engine failures caused by stale fuel varnish	

								12. Identify engine failure caused by lean mixture	
								13. Identify the effects of overspeeding on engine component parts	
								14. Identify the signature break on a connecting rod on several engine failure examples	
								15. Identify exhaust port piston scoring and large bearings due to overspeeding	
								16. Identify the effects of excessive vibration on engine block and mounting base	
								Other:	

0	1	2	3	4	5	6	X. Demonstrate leadership skills in the classroom, industry, and society	Notes:
							*1. Determine an understanding of VICA, its structure, and activities	
							*2. Demonstrate an understanding of one's personal values	
							*3. Perform tasks related to effective personal management skills	
							*4. Demonstrate good interpersonal skills	
							*5. Demonstrate etiquette and courtesy	
							*6. Demonstrate effectiveness in and oral written communication	
							*7. Develop and maintain a code of professional ethics	
							*8. Maintain a good professional appearance	
							*9. Perform tasks related to securing and terminating employment	
							*10. Perform basic parliamentary procedures in group meetings	
							Other:	